SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 14, 1882. — On the genus *Meliola*, by H. Marshall Ward, B.A., Fellow of Owens College, Manchester. The author has examined the life-history and structure of several species of these epiphytic fungi. The fungus consists of a much-branched mycelium, on which appendages and fruit-bodies occur. The *hyphæ* constituting the *mycelium*, consist of cylindrical cells, with hardened, brown cell-walls and protoplasmic contents; these are attached to the epidermis of the leaves, &c., of tropical plants by rudimentary *haustoria*, which do not pierce the cell-walls of the host, but are firmly adherent to the cuticle. The appendages consist of simple or branched setaceous outgrowths, which spring from the mycelium at various points, and are especially developed around the fruit-bodies from masses of hyphæ, which Bornet considered as forming a special part of the fungus, under the name of "receptacle"; these setæ cannot be considered as subserving any special function, however, and are certainly not tubes for the outlet of spores, as earlier observers have surmised. Other appendages occur in the form of small ovoid or flask-shaped lateral branchlets; some of these become free and subserve vegetative reproduction as *conidia*. The fruit-body, or *perithecium*, arises by continuous development of one of the pyriform lateral branchlets, and the author has studied its development very particularly. The short, ovoid, unicellular branchlet, after becoming separated from the parent hypha by a septum, suffers division into two cells by a septum running obliquely across it; of these two cells one produces the outer walls of the *perithecium*, by continuous cell-multiplication, whilst the other contributes the central portion, or *ascogonium*, by slower division of its contents.

The former cell, dividing up more rapidly, produces a layer of cells which envelope the latter by a process of "epibioly," and the outer cell-walls become hard, thick, and dark-coloured. The latter—ascogenous cell—divides up more slowly into a "core" of thin-walled cells, very rich in protoplasm. After complete envelopment, the cells of the "core" are recognised in vertical sections; certain of them become elongated, and form the earliest *asci*, while others become absorbed—together with inner cells of the enveloping layer—to provide nutritive material for the developing *asci* and their progeny.

The *asci* are produced successively, and are delicate clavate sacs, containing two to eight *spores*, each spore being divided by one, two, or three cross septa. The germination of the *spore* is also described and figured; it throws out an irregular germinal tube, which soon forms rudimentary *haustoria*, and grows forth as a mycelium, similar to that from which the *perithecium* was produced.

The author examines and criticises the views held by Bornet and Fries as to the systematic position of *Meliolas*; especially the opinion that they are to be considered as tropical representatives of the European *Erysipheæ*. He shows that the original cell from which the *perithecium* arises must be regarded as containing in itself the undifferentiated elements of an *Archecarpium* and *Antheridium*-branch (in the sense of De Bary and others), and that after the primary division into two cells, we must look upon one of these—the one which becomes more rapidly divided up—as the homologue of the *antheridium*-branch and enveloping tissues of the *Erysiphæ*; the more slowly divided cell—which produces the *ascogenous* core—being the equivalent of the *ascogonium*, &c., of those fungi. The details of successive phases of development are amply illustrated by figures and many peculiarities acquired by the group are carefully examined and described.

The author concludes that the *Meliolas* must be looked upon as a group developed along similar lines to those of the *Erysipheæ*, *Eurotium*, &c., but in which the sexual process has suffered still greater reduction or withdrawal, leading to those forms in which it is entirely suppressed.

With respect to the injurious action of these fungi on their hosts, the author decides that no direct parasitic action on the cell-contents takes place, but that injury results indirectly on account of the dense black *mycelium*, when strongly developed, depriving the leaves of air, light, &c.

Chemical Society, December 21, 1882.—Dr. Gilbert, president, in the chair.—The following papers were read:—On the condensation products of oenanthol (part ii.), by W. H. Perkin, jun. The author has studied the action of nascent hydrogen upon oenanthol; when this substance is dissolved in acetic acid and acted upon by sodium amalgam, heptylic alcohol is produced, also an aldehyde, $C_{14}H_{26}O$, and an alcohol, $C_{14}H_{28}O$; if the oenanthol is dissolved in ether, heptylic alcohol, a solid aldehyde melting at 29°·5 ($C_{14}H_{28}O$), and a second substance, $C_{21}H_{40}O$, are formed. By oxidising the aldehyde $C_{14}H_{28}O$ with silver oxide, a small quantity of an acid, $C_{14}H_{28}O_2$, boiling at 300°–310°, was obtained. The author has also studied the action of nascent hydrogen upon the aldehyde $C_{14}H_{28}O$, and discusses the constitution of these new bodies.—On the behaviour of the nitrogen of coal during destructive distillation; with some observations on the estimation of nitrogen in coal and coke, by W. Foster. It is usually stated in text-books that coal contains about 2 per cent. of nitrogen, which, during destructive distillation of the coal, comes off as ammonia. The author finds that this statement is not true. A Durham coal was used, containing 1·73 per cent. of nitrogen, and giving 74·5 per cent. of coke. If the total quantity of nitrogen in the coal be taken as 100, that evolved as ammonia is only 14·5 per cent.; as cyanogen, 1·56 per cent; as nitrogen in the coal-gas, 35·26 per cent.; left behind in the coke, 48·68 per cent.—On the absorption of weak reagents by cotton, silk, and wool, by E. J. Mills and J. Takamine. The reagents are sulphuric and hydrochloric acids, and caustic soda. This paper chiefly contains tables, with results calculated to five places of decimals.—On brucine, by W. A. Shenstone. Various observers have stated that brucine, when treated with dilute nitric acid, yields either methyl or ethyl, nitrate or nitrite. The author has studied the action of hydrochloric acid upon brucine quantitatively, and has proved that more than one molecule of methyl chloride is evolved from one molecule of brucine; he concludes that brucine is strychnia, in which two atoms of hydrogen are replaced by two methoxyl groups, and its formula may be written, $C_{21}H_{20}(CH_3O)_2N_2O_2$.—Researches on the induline group, by O. N. Witt and E. G. P. Thomas. "Induline" is a term applied to all coloured compounds formed by the action of amidoazo compounds on the hydrochlorides of aromatic amines with elimination of ammonia. The authors have studied in the present paper the formation of amidoazobenzene, and its action on aromatic hydrochlorides, and especially on anilin hydrochloride.—Preliminary note on some diazo derivatives of nitrobenzylcyanide, by W. H. Perkin.

Meteorological Society, December 20, 1882.—Mr. J. K. Laughton, M.A., F.R.A.S., president, in the chair.—Three new Fellows were elected, and Capt. J. de Brito Capello and Mr. W. Ferrel, M.A., were elected honorary members.—The following papers were read:—Popular weather prognostics, by the Hon. R. Abercomby, F.M.S., and Mr. W. Marriott, F.M.S. The authors explain over 100 prognostics, by showing that they make their appearance in definite positions relative to the areas of high and low atmospheric pressure shown in synoptic charts. The method adopted not only explains many which have not hitherto been accounted for, but enables the failure, as well as the success, of any prognostic to be traced by following the history of the weather of the day on a synoptic chart. The forms discussed are:—cyclones, anticyclones, wedge-shaped and straight isobars. The weather in the last two is now described for the first time. They also point out (1) that prognostics will never be superseded for use at sea, and other solitary situations; and (2) that prognostics can be usefully combined with charts in synoptic forecasting, especially in certain classes of showers and thunderstorms which do not affect the reading of the barometer. —Report on the phenological observations for the year 1882, by the Rev. T. A. Preston, M.A., F.M.S. The most important feature of the phenological year was the mild winter. The effect of this upon vegetation was decidedly favourable; and had it not been for the gales—especially that of April 28—the foliage would have been luxuriant, and therefore free from insect attacks, but the contrary effect has been produced on insect life, for the scarcity of insects, especially butterflies and moths, has been the general remark of entomologists.—Mr. J. S. Dyason, F.R.G.S., exhibited a series of typical clouds in monochrone, and also a series of sketches of clouds in colour, made in June, July, and August, 1882.

MANCHESTER

Literary and Philosophical Society—Microscopical and Natural History Section, December 12.—Prof. Roscoe in the chair.—Mr. James Heelis made some remarks upon the causes of the movement of the old Rhone Glacier with special reference to the power of gravity to produce such movement when

considered in connection with the gradient down which the glacier has passed.—Prof. Osborne Reynolds, F.R.S., communicated and explained an elementary solution of the dynamical problem of isochronous vibration.—Mr. John Boyd exhibited a fine living specimen of *Argulus foliaceus*, a parasite of the carp.—Mr. Charles Bailey, F.L.S., made some remarks on the occurrence of *Selinum carvifolia* in Lincolnshire, and of *Potamogeton zizii* in Lancashire and Westmoreland, and mentioned the localities where he had met with them respectively.—Mr. R. D. Darbishire, F.G.S., gave an account of dredgings made by him in company with Dr. A. M. Marshall and Mr. Archer at Oban in September last, and exhibited specimens of a considerable variety of animals taken.—Prof. A. M. Marshall, M.A., gave a detailed description of three forms of Pennatulida met with during the dredging, and suggested the desirability of the section undertaking or taking part in similar excursions in future years.

DUBLIN

Royal Society, November 20, 1882.—Sections I. and III. Physical and Experimental Science, and Applied Science.—Rev. Gerald Molloy, D.D., in the chair.—The following communications were received:—Rev. H. M. Close, M.A., on the definition of force as the cause of motion, with some of the inconveniences connected therewith.—G. Johnston Stoney, D.Sc., F.R.S., and G. Gerald Stoney, on the energy expended in propelling a bycicle, parts 2 and 3.—Prof. W. F. Barrett, F.R.S.E., physical apparatus for class-teaching.—A. H. Curtis, LL.D., improved apparatus for exhibiting double reflection in the interior of a crystal.—Prof. G. F. Fitzgerald, F.T.C.D., recent advances in physical science, an account of Prof. Rowland's curved gratings for spectrum analysis.—Prof. Fitzgerald exhibited photographs of the solar spectrum taken by Prof. Rowland.

Section II. Natural Science.—Rev. A. H. Close, M.A., in the chair.—The following communications were received:—Prof. V. Ball, M.A., F.R.S., on some effects produced by landslips and movements of the soil cap, and their resemblance to phenomena which are generally attributed to other agencies.—Prof. A. C. Haddon, M.A., exhibition of marine invertebrates, belonging to the Natural History Museum, prepared at the Zoological Station, Naples, with remarks upon the various methods for the preparation of zoological specimens.—G. A. Kinahan, on the geology of Bray Head.

December 18, 1882.—Sections I. and III. Physical and Experimental Science, and Applied Science.—A. H. Curtis, LL.D.; in the chair.—The following communications were received:—G. F. Fitzgerald, F.T.C.D., on Dr. Eddy's hypothesis that radiant heat is an exception to the second law of thermodynamics.—Communicated by Howard Grubb, M.E., F.R.A.S.: (*a*) Notes on the transit of Venus, as observed at Armagh Observatory by Dr. Dreyer; (*b*) Notes on the transit of Venus, as observed at Cork Observatory by Prof. England; (*c*) Notes of the transit of Venus, as observed at Rathowen, Co. Westmeath, by Mr. W. E. Wilson.—G. Johnstone Stoney, D.Sc., F.R.S., on means of neutralising echoes in rooms.—G. Johnstone Stoney and G. Gerald Stoney, on geared bicycles and tricycles.—Dr. Otto Bœddicker, on the influence of magnetism on the rate of a chronometer (communicated by the Right Hon. the Earl of Rosse, F.R.S.)—Mr. Grubb informed the Society that Dr. Huggins had authorised him to announce that he had succeeded in photographing the corona of the uneclipsed sun by employing absorbing media.

PARIS

Academy of Sciences, December 18.—M. Jamin in the chair.—The following papers were read:—On a recent memoir, by M. Wolf, of Zurich, on the periodicity of sun-spots, by M. Faye. From further careful study (by a method described) of data for the last 120 years, M. Wolf concludes (1) that there is a period of 10 years; also (2) a period of 11 years, 4 months; and (3) that there is not a period of 12 years, imputable to the action of Jupiter. Spite of the great difference of the two periods, the interval between a minimum and the next maximum is the same in both, viz. 4½ years. After 170 years the phenomena recur in the same order, and with the same numerical values. M. Faye added some remarks by way of theory.—Statistics of preventive vaccination against *charbon* relating to 85,000 animals, by M. Pasteur. The figures (for Eure-et-Loire, where the ravages have been worst) show a marked reduction of the mortality from *charbon;* thus, of the 80,000 sheep vaccinated, only 0·65 per cent. died, whereas the average mortality of the past 10 years is 9·01 per cent.—Contribution to the study of rabies, by M. Bert. He gives results published a few years ago, but little known. *Inter alia*, inoculation with mucus from the respiratory passages of a mad dog caused rabies, but that with the salivary liquids did not. Reciprocal transfusion of blood between a healthy and a mad dog did not cause rabies in the former. The slaver of a mad dog, after filtering through plaster, was harmless, but the portion caught on the plaster caused rabies (which is thus probably due to a microbe).—On the functions of seven letters, by M. Brioschi.—Experiments with a new arrangement of the automotor elevating apparatus with oscillating tube, by M. de Caligny.—M. Faye presented the second and last volume of his "Cours d'Astronomie."—M. de Quatrefages announced the formation of a committee, headed by M. Milne-Edwards (who is now convalescent) for a monument to Darwin, as proposed in England.—On maize at different periods of its vegetation (continued), by M. Leplay.—M. Ladureau (in a memoir) stated that he has found, on an average, 1·80 cc. of sulphurous acid (free and combined) per cubic metre of air in the atmosphere of Lille.—The Secretary called attention to a new work on Galileo, by Signor Favaro, asked to be informed of any documents relative to Fermat (whose works are to be published by the Minister of Public Instruction), and read some telegrams on the transit of Venus.—Observations of the transit of Venus at Algiers Observatory, by M. Trépied. Bad weather marred the work. The spectrum, and photographs taken in the green, blue, and violet, showed no absorption by an atmosphere round Venus.—On the transit as observed at Rome, by M. Millosevich. He thinks the spectroscopic method the only one capable of giving good results, which admit of being tested, for the first contact.—On the great southern comet, as observed at the Imperial Observatory of Rio de Janeiro, by M. Cruls. On October 15 there were two nuclei, and he thinks the appearance of the tail due to two tails (corresponding to the nuclei).—On solar photometry, by M. Crova. By a method described, and by Bougner's method, he arrives at about 60,000 carcels for the intensity of the solar light on a clear day (at Montpellier), an estimate ten times those of Bougner and Wollaston.—Reply to M. Ledieu, &c., by M. Decharme.—On the sensation of white and complementary colours, by M. Rosenstiehl. The introduction of a coloured object in an illumination apparently homogeneous and colourless, at once shows the real lack of homogeneity in the combination of lights. There is often confusion between mixture of lights and mixture of sensations.—Researches on the duration of solidification of surfused substances, by M. Gernez. He worked with U tubes holding phosphorus. The course of the phenomenon is uniform. Previous heating of the phosphorus to different temperatures did not sensibly affect the velocity of solidification. M. Gernez studies the curve for velocity of solidification at different temperatures (43°·8 to 24°·9).—On the measurement of pressures developed in a closed vessel by explosive gaseous mixtures, by M. Vieille. The method (described) was to register the law of displacement of a piston of known section and mass; (results shortly).—On the crystallisation of hydrate of chlorine, by M. Ditte.—On chloride of pyrosulphuryl, by M. Konovaloff.—On the products of distillation of colophanry, by M. Renard.—Production of surgical anæsthesia, by combined action of protoxide of nitrogen and chloroform, by M. de Saint Martin. With protoxide of nitrogen (85 vol.), and oxygen (15 vol.) M. Bert got anæsthesia by operating under pressure. If 6 or 7 gr. chloroform be added per hectolitre, the effect is had quickly at ordinary pressure.—Passage of the bacterium of *charbon* from mother to fœtns, by MM. Strauss and Chamberland.—Physiological properties of oxethylquinoleine-ammonia, by M. Bochefontaine. Like curare, it prevents passage of excitation from nerve to muscle, but, unlike curare, it makes the heart beat more slowly.—Experimental researches on spontaneous contractions of the uterus in certain mammalia, by M. Dembo.—On the formation of embryonal layers in the trout, by M. Hennegny.—Remarks on M. Lichtenstein's paper on pucerons, by M. Balbani.—Orographic note on the region of the Jura between Geneva and Poligny, by M. Bourgeat.—On a phenomenon of molecular mechanics, by M. Trève. He covers the tops of ivory balls, hung in a row, with metallic powder; when one end ball (say the left) is drawn back and let fall on its neighbour, the powder on the right half of the balls is thrown in the direction of the shock; but that on the last ball is thrown from the side opposite to the direction of the shock.

December 26.—M. Jamin in the chair.—The following papers were read:—Observations of the transit of Venus at the Naval Observatory of Toulon, by M. Mouchez. M. Rozet observed the black drop at second contact.—On two objections of Prof. Young of New Jersey, to the cyclonic theory of sunspots, by M. Faye. These are, the absence of visible traces of rotation in most spots, and the small difference of angular velocity in successive zones of the photosphere. M. Faye holds the unequal velocity sufficient to cause vortical movements of any calibre; and the general absence of agitation at the border of spots he attributes to the slowness of gyration there (our cyclones seen from above would show the same). He cites a number of positive indices of gyration.—Theory of the resistance of woven materials to extension, by M. Tresca. Such stuffs suffer elongations which increase less rapidly than the weights; and with equal weight, they show much greater elongation than those of the warp-threads composing them. The mode of interlacing of the threads explains these differences.—On the necessity of introducing certain modifications into the teaching of mechanics, and of banishing certain problems; *e.g.* the motion of the solid body of geometers, by M. Villarceau.—Considerations on the general theory of units, by M. Ledieu.—Separation of gallium (continued), by M. Lecoq-de-Boisbaudran. — Herr Bunsen was elected Foreign Associate in room of Wöhler, deceased.—Chemical studies on maize, &c. (continued), by M. Leplay.—Evolution of microscopic organisms in the living being, and in the dead body and morbid products, by M. Colin. Microbes are nowhere absent in the respiratory and digestive apparatus, and at many points they are prodigiously numerous. In normal conditions the liquids holding them are harmless, but they become dangerous after putrid alteration.—The first number of a new mathematical journal, *Acta Mathematica*, published at Stockholm (M. Mittag-Leffler, editor), was presented.—A telegram from Montevideo announced success of the transit observations at Santa Cruz.—Observation of the transit of Venus at Nice Observatory, by M. Mouchez. Five photographs were had, under difficult conditions.—Observation of the transit at Avila (Spain), by M. Thollon. They sought to observe Venus's atmosphere spectroscopically at a height of 1200 m., but bad weather prevented their getting any satisfactory results.—Photographs of the great comet of 1882 taken at the Observatory of the Cape of Good Hope, by Mr. Gill. Spite of long exposure (140 minutes for the sixth and last photograph), the stars at the centre of the image are remarkably distinct. More than fifty stars are seen through the tail. Mr. Gill does not doubt that stellar maps might be produced by direct photography of the heavens.—On the formula recently communicated to the Academy regarding prime numbers, by M. de Jonquières.—On the same, by M. Lipschitz.—Reply to a recent note by M. Lalanne on the verification and use of magnetic maps, by M. de Tillo.—Electrodynamic method for determination of the ohm; experimental measurement of the constant of a long coil, by M. Lippmann.—Measurement of the photometric intensity of spectral lines of hydrogen, by M. Lagarde. The curves from the values obtained show the inequality of intensity of the three lines, inequality variable with the induced discharge. With diminution of pressure, the curve straightens; at 6·5 mm., that for red is a straight line.—On the instantaneous pressure produced during combustion of gaseous mixtures, by MM. Mallard and Le Chatelier. With mixtures of H and O, the interior pressure exceeded by more than 2 atm. that corresponding really to the temperature of combustion; and this occurred in less than a ten-thousandth of a second. An explanation is offered.—On bisulphhydrate of ammonia, by M. Isambert.—On a case of physical isomerism of monochlorinated camphor, by M. Cazeneuve.—Biological researches on beet, by M. Corenwinder.—On the reduction of sulphates by sulphuraria, and on the formation of natural metallic sulphates, by M. Plauchud.—On the transformation of nitrates into nitrites, by MM. Gayon and Dupetit. They have isolated four distinct microbes capable of the action; one can live in chicken broth even when this is saturated with nitrate of potash, and decompose 10 gr. of the nitrate per litre daily. The microbes of chicken cholera, the bacterium of charbon, and the septic vibrion, effect denitrification much less easily.—On the poisonous principles of edible fungi, by M. Dupetit. Injecting, subcutaneously, the fresh juice of several such fungi into rabbits, &c., he observed symptoms of poisoning, followed by death. The chemical properties of the active principle recall those of soluble ferments, rather than of known alkaloids. A temperature of 100° renders the juice harmless.—Researches on the production of a general anæsthesia or a specially unilateral anæsthesia by a simple peripheric excitation, by M. Brown-Séquard. Irritation of the laryngeal mucous membrane with a current of carbonic acid will produce anæsthesia in all parts of the body, without passage of this gas into the blood.—On the physiological action of coffee, by M. Guimaraeo. The experiments (made on dogs at Rio) prove that coffee is at once a stimulant and a repairer. By permitting a greater expenditure and consumption of argotised substances, it evidently increases the power of work.—On the structure of cells of the mucous bodies of Malpighi, by M. Ranvier.—On the fœtal envelopes of Chiroptera of the family of Phyllostomides, by M. Robin.—On an usteria from great depths of the Atlantic, provided with a dorsal peduncle, by M. Perrier. This is a "find" of the *Travailleur* cruise, and is named *caulaster pedunculus*.—On the suctocitiates of M. de Merejkovsky, by M. Maupas. The type deseribed, he says, has been long known.—Mineralogical analysis of the rock impasted in the meteorite of Atacama, by M. Meunier.

BERLIN

Physical Society, December 15, 1882.—Prof. Helmholtz in the chair.—Prof. Christiani demonstrated some acoustic experiments which he had incidentally made. In renovation of the Kœnig tuning-forks injured by the fire in the Physiological Institute, and which had to be freed from their coating of rust, and mounted on new resonance cases, one fork of the series, the fork mi_3, showed after tuning and sounding, when one side of it was turned towards the closed end of the case, a maximum of tone; it did not matter in which direction (right or left) the fork was turned round into the position referred to. Another fork mi_3 of the physical Institute in unison with the first, did not present the phenomenon, and when the forks and cases were exchanged, it appeared that the effect was connected with the new case. It was not explained. A second experiment, made by Prof. Christiani, was named by him "total absorption of tone." A singing flame was tuned approximately to the tone mi_3, and the resonance case bearing the tuning-fork mi_3 was held with its open end horizontal near the upper end of the chemical harmonica. The tone was unaffected. When, however, the same case, without tuning-fork, was brought to the same position relatively to the sounding chemical harmonica, the sound immediately ceased, and the flame burned quietly in the tube. Each time the tone of the flame ceased, when the mouth of a resonator adapted to the pitch was brought to the upper end of the tube, whereas the flame sounded again when the resonator was tuned to a different tone, or was loaded with a tuning-fork. Prof. Christiani means to investigate the phenomenon further.

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